
APPENDIX G

GLOSSARY OF TERMS

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Abiotic	Nonliving, pertaining to physical-chemical factors only.
Absorption	The process of taking up matter or energy by a substance.
Activated sludge	A secondary wastewater treatment process that removes organic matter by mixing air and recycled sludge bacteria with sewage to promote decomposition.
Acute toxicity	A chemical stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.
Adsorption	The process by which atoms, molecules, or ions are taken up from soil, water solution, or soil atmosphere and retained on surfaces of solids by chemical or physical bonding.
Advection	Bulk transport of the mass of discrete chemical or biological constituents by fluid flow within a receiving water. Advection describes the mass transport due to the velocity, or flow, of the waterbody.
Aerobic	Environmental conditions characterized by the presence of oxygen; used to describe biological or chemical processes that occur in the presence of oxygen.
Aggradation	Process by which stream beds, flood plains, and the bottoms of other water bodies are raised in elevation by the deposition of material eroded and transported from other areas.
Algae	Any organisms of a group of chiefly aquatic nonvascular plants; most algae have chlorophyll as the primary pigment for carbon fixation. As primary producers, algae serve as the base of the aquatic food web, providing food for zooplankton and fish resources. An overabundance of algae in natural waters is known as eutrophication.
Algal bloom	Rapidly occurring growth and accumulation of algae within a body of water, usually resulting from excessive nutrient loading and/or sluggish circulation regime with a long residence time. Persistent and frequent blooms can result in low oxygen conditions.
Algal growth	Increase in algal biomass. Algal growth is related to temperature, available light, and the available abundance of inorganic nutrients (N,P,Si). Algal species groups (e.g., diatoms, greens, etc.) are typically characterized by different maximum growth rates.

Algal respiration	Process of endogenous respiration of algae in which organic carbon is oxidized to carbon dioxide.
Algal settling	Loss of phytoplankton cells from the water column by physical sedimentation of the cell particles. Algal biomass lost from the water column is then incorporated as sediment organic matter and undergoes bacterial and biochemical reactions releasing nutrients and consuming dissolved oxygen.
Allochthonous	Material derived from outside a habitat or environment under consideration.
Alluvium	Sand, clay, and other earth materials gradually deposited by streams along riverbeds and floodplains.
Ambient conditions	Natural levels or conditions of environmental factors such as temperature.
Ambient water quality	Natural concentration of water quality constituents prior to mixing of either point or nonpoint source load of contaminants. Reference ambient concentration is used to indicate the concentration of a chemical that will not cause adverse impact to human health.
Ammonia	Inorganic form of nitrogen; product of hydrolysis of organic nitrogen and denitrification. Ammonia is preferentially used by phytoplankton over nitrate for uptake of inorganic nitrogen.
Ammonia toxicity	Under specific conditions of temperature and pH, the un-ionized component of ammonia can be toxic to aquatic life. The un-ionized component of ammonia increases with pH and temperature.
Amphibian	Any of a class of vertebrate animals most of which have both aquatic larval and terrestrial adult stages.
Anaerobic	Environmental condition characterized by zero oxygen levels. Describes biological and chemical processes that occur in the absence of oxygen.
Analytical model	Exact mathematical solution of the differential equation formulation of the transport, diffusion, and reactive terms of a water quality model. Analytical solutions of models are often used to check the magnitude of the system response computed using numerical model approximations.
Anoxic	Aquatic environmental conditions containing zero or little dissolved oxygen. See also Anaerobic.
Anthropogenic	Pertains to the [environmental] influence of human activities.

Aphotic	Characterized by a lack of light; below the level of light penetration in water.
Aquatic ecosystem	Complex of biotic and abiotic components of natural waters. The aquatic ecosystem is an ecological unit that includes the physical characteristics (such as flow or velocity and depth); the biological community of the water column and benthos; and the chemical characteristics such as dissolved solids, dissolved oxygen, and nutrients. Both living and nonliving components of the aquatic ecosystem interact and influence the properties and status of each other component.
Assimilation	Uptake of food and/or contaminant through the gut.
Assimilative capacity	The amount of contaminant load (expressed as mass per unit time) that can be discharged to a specific stream or river without exceeding water quality standards or criteria. Assimilative capacity is used to define the ability of a waterbody to naturally absorb and use waste matter and organic materials without impairing water quality or harming aquatic life.
Attached algae	Photosynthetic organisms that remain stationary by attachment to (usually) hard rocky substrate. Attached algae, usually present in shallow hard-bottom environments, can significantly influence nutrient uptake and diurnal oxygen variability. See Periphyton.
Autochthonous	Material derived from within a habitat, such as through plant growth.
Autotroph	Organisms that derive cell carbon from carbon dioxide. The conversion of carbon dioxide to organic cell tissue is a reductive process that requires a net input of energy. The energy needed for cell synthesis is provided by either light or chemical oxidation. Autotrophs that use light (phototrophs) include photosynthetic algae and bacteria. Autotrophs that use chemical energy (chemotroph) include nitrifying bacteria.
Average annual runoff	The average value of annual runoff volume calculated for a selected period of record, at a specified location, such as a dam or stream gage.
Background levels	Background levels represent the chemical, physical, and biological conditions that would result from natural geomorphological processes such as weathering or dissolution.
Backwater	A temporary or permanent water body out of the main river or stream channel and at the edge of the flood plain, most often caused by an obstruction or constriction in the main channel or waterbody.

Bacterial decomposition	Breakdown by oxidation or decay of organic matter by heterotrophic bacteria. Bacteria use the organic carbon in organic matter as the energy source for cell synthesis.
Bankfull	A discharge or flow rate within a river which just fills the channel, and when exceeded, will inundate adjacent lands.
Base flow	That part of the stream discharge that is not attributable to direct runoff from precipitation or melting snow; it is usually sustained by ground-water discharge to the stream.
Bedload	Sediment particles, composed mostly of coarse materials, that are moving on or near the bottom due to flow within the stream or river.
Benthic ammonia flux	The decay of organic matter within the sediments of a natural water body results in the release of ammonia nitrogen from the interstitial water to the overlying water column. Benthic release, or regeneration, of ammonia is an essential component of the nitrogen cycle.
Benthic drift	Downstream transport of invertebrates, especially insect larvae.
Benthic photosynthesis	Synthesis of cellular carbon by algae attached to the bottom of a natural water system. Benthic photosynthesis typically is limited to shallow waters because of the availability of light at the bottom.
Benthic	Refers to material, especially sediment, at the bottom of an aquatic ecosystem. It can also be used to describe the organisms that live on or in the bottom of a waterbody.
Benthos	Those organisms that live in or on the bottom of a body of water.
Bioaccumulation	The uptake of contaminants, such as PCBs, from all sources including direct sorption to the body, transport across gill membranes, and through ingestion of prey and sediments. See Bioconcentration and Biomagnification.
Biochemical Oxygen Demand (BOD)	The amount of oxygen per unit volume of water required to bacterially or chemically oxidize the oxidizable matter in water. Biochemical oxygen demand measurements are usually conducted over specific time intervals (5, 10, 20, 30 days). The term BOD generally refers to the standard 5-day BOD test.
Bioconcentration	The direct uptake of contaminants from the dissolved phase through direct sorption to the body and through transport across gill membranes. See Bioaccumulation and Biomagnification.
Biodegradable	Able to be broken down into simple inorganic substances by the action of decomposers (bacteria and fungi).

Bioenergetics	Processes leading to growth and expenditure of energy by organisms.
Biomagnification	The step-by-step concentration of chemicals in successive levels of a food chain or food web. See Bioaccumulation and Bioconcentration.
Biomass	The amount or weight of a species or group of biological organisms within a specific volume or area of an ecosystem.
Biota	The fauna and flora of a habitat or region.
Biotransformation	The process by which compounds are changed by decomposers and by higher organisms. One example is dechlorination of PCBs.
Bioturbation	Disturbance of surficial sediments through burrowing of invertebrates, amphibians, and reptiles, and feeding and nest-building of fish.
Bottom feeders	Fish that feed on sediments and benthic organisms.
Boundary conditions	Values or functions representing the state of a system at its boundary limits, either in space or time.
Calibration	Testing and tuning of a model to a set of field data not used in the development of the model; also includes minimization of deviations between measured field conditions and output of a model by selecting appropriate model coefficients.
Carbonaceous	Pertaining to or containing carbon derived from plant and animal residues.
Channel improvement	The improvement of the flow characteristics of a channel by clearing, excavation, realignment, lining, or other means in order to increase its capacity. Sometimes used to connote channel stabilization.
Channel stabilization	Erosion prevention and stabilization of velocity distribution in a channel using jetties, drops, revetments, vegetation, and other measures.
Channel	A natural stream that conveys water; a ditch or channel excavated for the flow of water.
Chitin	Composition of the exoskeleton of an arthropod.
Chloride	An ion of chlorine in solution, bearing a single negative charge.
Chlorination	Combination with chlorine or a chlorine compound.
Chlorophyll	A group of green photosynthetic pigments that occur primarily in the chloroplast of plant cells. The amount of chlorophyll- <i>a</i> , a specific pigment, is frequently used as a measure of algal biomass in natural waters.

Chronic toxicity	Toxicity impact that becomes evident only after a relatively long period of time, often one-tenth of the life span or more. Chronic effects could include reduced growth, reduced reproduction, or death.
Coliform bacteria	A group of bacteria that normally live within the intestines of warm-blooded animals, including humans. Coliform bacteria are used as an indicator of the presence of sewage in natural waters.
Combined Sewer Overflow (CSO)	A combined sewer carries both wastewater and stormwater runoff. CSO discharges to receiving water can result in contamination problems that may prevent the attainment of water quality standards.
Complete mixing	The modeling assumption that no significant difference in concentration of an ecosystem constituent or pollutant exists either across the transect or along the length of the waterbody or a portion of the waterbody.
Concentration	Amount of a substance or material in a given unit volume of water or mass of sediment or organisms. Usually measured in milligrams per liter (mg/L) or parts per million (ppm).
Congener	One of the 209 different PCB molecular configurations. A congener may have between 1 and 10 chlorine atoms, which may be located at various positions on the PCB molecule.
Congener-specific analysis	A form of chemical analysis that distinctly identifies and quantifies individual PCB congeners. It allows scientists to see distinct PCB patterns or signatures in the environment. These can identify the PCB source material, the likely source areas, and the degree and type of subsequent alteration.
Conservative substance	Substance that does not undergo any chemical or biological transformation or degradation in a given ecosystem.
Consumer	An organism that eats a plant or another animal.
Contamination	Act of polluting or making impure; any indication of chemical, sediment, or biological impurities.
Conventional pollutants	As specified under the Clean Water Act, conventional contaminants include suspended solids, coliform bacteria, BOD, pH, oil, and grease.
Core sampling	Sampling of sediment or soil by pushing a hollow tube into the river bottom and removing a core. The cylindrical core sample is then sliced and the various slices analyzed. High-Resolution Sampling requires slicing the core into many thin slices (approximately 1 to 1.5-inches thick). Low-Resolution Sampling requires slicing the core into fewer slices (approximately 9-inches thick).

Criteria	Water quality criteria (WQC) comprise numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality goal.
Cross-sectional area	Wet area of a waterbody normal, or perpendicular, to the longitudinal component of the flow.
Crustacea	A Class (large grouping) of the Phylum Arthropoda, including crayfish and water fleas, that bear a horny shell.
Decay	Gradual decrease in the amount of a substance in a system due to various sink processes including chemical and biological transformation, dissipation to other environmental media, or deposition into storage areas.
Dechlorination	The process of removing chlorine atoms from a PCB molecule while leaving the main molecular structure intact. In most instances, dechlorination of a PCB molecule simply yields a different PCB molecule.
Decomposers	Bacteria and fungi that break down organic detritus.
Decomposition	Metabolic breakdown of organic materials by bacteria and fungi, releasing energy and simple organics and inorganic compounds. See also Respiration.
Deep percolation	The drainage of soil water downward by gravity below the maximum effective depth of the root zone toward storage in subsurface strata.
Degradation	The sum of natural processes which cause a decrease in PCB mass by either dechlorination or outright destruction of PCB molecules.
Denitrification	Under anaerobic or low-oxygen conditions, denitrifying bacteria synthesize cellular material by reducing nitrate to ammonia and nitrogen gas.
Depuration	Excretion of contaminant by an organism.
Designated use	Uses specified in water quality standards for each waterbody or segment regardless of actual attainment.
Desorption	The process by which chemicals are detached and released from solid surfaces. The opposite of adsorption.
Detritus	Organic material resulting from the death or disintegration (such as sloughing of macrophyte leaves) of organisms; usually with associated decomposers.

Diagenesis	Any alteration of sediments, especially through compaction and decomposition.
Diatom	Algae of the Phylum Chrysophyta, commonly unicellular with a siliceous case.
Dilution	Addition of less-concentrated liquid (water) that results in a decrease in the original concentration.
Discharge	The volume of water that passes a given point within a given period of time. It is an all-inclusive outflow term, describing a variety of flows such as from a pipe to a stream, or from a stream to a lake or ocean.
Discharge Monitoring Report (DMR)	Report of effluent characteristics submitted by a municipal or industrial facility that has been granted an NPDES discharge permit.
Discharge permits (NPDES)	A permit issued by EPA or a State regulatory agency that sets specific limits on the type and amount of pollutants that a municipality or industry can discharge to a receiving water; it also includes a compliance schedule for achieving those limits. It is called the NPDES permit because the permit process was established under the National Pollutant Discharge Elimination System, under provisions of the Federal Clean Water Act.
Disequilibrium	Not in equilibrium.
Dispersion	The spreading of chemical or biological constituents, including pollutants, in various directions from a point source at varying velocities depending on the differential instream flow characteristics.
Dissolved Oxygen (DO)	The amount of oxygen that is dissolved in water. It also refers to a measure of the amount of oxygen available for biochemical activity in a water body and as indicator of the quality of that water.
Dissolved oxygen sag	Longitudinal variation of dissolved oxygen representing the oxygen depletion and recovery following a waste load discharge into a receiving water.
Diurnal	Actions or processes having a period or cycle of one day, particularly the daylight-night cycle.
Domestic wastewater	Also called sanitary wastewater, consists of wastewater discharged from residences and from commercial, institutional, and similar facilities.
Drainage basin	Land area enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into a receiving water. Also referred to as watershed, river basin, or hydrologic unit.

Dye study	Use of conservative substances to assess the physical behavior of a natural system to a given stimulus.
Dynamic equilibrium	A state of relative balance between processes having opposite effects.
Dynamic model	A mathematical formulation describing the physical behavior of a system or a process and its temporal variability.
Dynamic simulation	Modeling of the behavior of physical, chemical, and/or biological phenomena and their variation over time.
Ecology	The study of the interrelationships of organisms with and within their environment.
Ecosystem	An interactive system that includes the organisms of a natural community association together with their abiotic physical, chemical, and geochemical environment.
Effluent	Municipal sewage or industrial liquid waste (untreated, partially treated, or completely treated) that flows out of a treatment plant, septic system, or pipe.
Egestion	Defecation.
Elimination	Loss of contaminant by organism, including biotransformation and depuration.
Emergent vegetation	Aquatic plants, usually rooted, which have portions above water for part of their life cycle.
Environment	The sum total of all the external conditions that act on an organism.
Epilimnion	The well-mixed surficial layer of a waterbody; above the hypolimnion.
Epiphyte	A plant growing on another plant; more generally, any organism attached and growing on a plant.
Equilibrium	A steady state in a dynamic system, with outflow balancing inflow.
Erosion	Wearing away and removal of materials of the earth's crust by natural means. Examples include Streambank and Streambed (scouring of material and cutting of channel banks and beds), Sheet (removal of a thin layer by runoff waters), Rill (forming numerous small channels), Gully (widening and deepening of small channels).
Estuary	Brackish water areas influenced by the tides where a river meets the sea.
Euphotic	Pertaining to the upper layers of water through which sufficient light penetrates to permit growth of plants.

Eutrophic	Aquatic systems with high nutrient input and high plant growth.
Eutrophication model	Mathematical formulation that describes the advection; dispersion; and biological, chemical, and geochemical reactions that influence the growth and accumulation of algae in aquatic ecosystems. Models of eutrophication typically include one or more species groups of algae; inorganic and organic nutrients (N,P); organic carbon; and dissolved oxygen.
Eutrophication	Enrichment of an aquatic ecosystem with nutrients (nitrates, phosphates) that accelerate biological productivity (growth of algae and aquatic weeds) and an undesirable accumulation of algal biomass.
Evapotranspiration	A collective term that describes water movement back to the atmosphere as a result of evaporation from soil surfaces and surface water bodies and by plant transpiration.
Extinction coefficient	Measure for the reduction (absorption) of light intensity within a water column.
Factor of safety	Coefficient used to account for uncertainties in representing, simulating, or designing a system.
Fate of pollutants	Physical, chemical, and biological transformation in the nature and changes of the amount of a pollutant in an environmental system. Transformation processes are pollutant specific. However, they have comparable kinetics so that different formulations for each pollutant are not required.
Fauna	The animals of a habitat or region.
Fecal coliform bacteria	Bacteria that are present in the intestines or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of water.
Fecundity	The capacity to produce offspring. Usually the number of eggs per female that hatch and become larvae.
Filamentous algae	Algae with long, thread-like growth form.
First-order kinetics	Describes a reaction in which the rate of transformation of a pollutant is proportional to the amount of that pollutant in the environmental system.
Flocculation	The process by which suspended colloidal or very fine particles are assembled into larger masses or flocs that eventually settle out of suspension.

Floodplain	That part of a river valley that is covered in periods of high (flood) water.
Flora	Plants of a habitat or region.
Fluvial	Pertaining to a stream.
Flux	Movement and transport of mass of any water quality constituent over a given period of time. Units of mass flux are mass per unit time.
Food chain	Animals linked by linear predator-prey relationships with plants or detritus at the base.
Food web	Similar to food chain, but implies cross connections.
Forage fish	Fish eaten by other fish.
Forcing functions	External empirical formulation used to provide model input describing a number of processes or conditions. Typical forcing functions include model inputs such as precipitation, temperature, point and tributary sources, solar radiation, and waste loads and flow.
Fugacity	Escaping tendency of a chemical from one state to another.
Gaging station	Particular site on a stream, canal, lake, or reservoir where systematic observations of height or discharge are obtained.
Geochemical	Refers to chemical reactions related to earth materials such as soil, rocks, and water.
Gradient	The rate of decrease (or increase) of one quantity with respect to another; for example, the rate of decrease of temperature with depth in a lake.
Groundwater	All subsurface water that fills the pores, voids, fractures, and other spaces between soil particles and in rock strata in the saturated zone of geologic formations.
Habitat	The environment in which a population of plants or animals occurs.
Half-saturation constant	Nutrient concentration at which the growth rate is half the maximum rate. Half-saturation constants define the nutrient uptake characteristics of different plant species.
Heterotrophs	Organisms that must obtain their food from living or dead organisms.
Homolog	A grouping of PCB congeners based on the number of chlorine atoms present on the molecule. There are 10 homolog groups corresponding to the range of chlorine atoms possible.

Humic	Pertaining to the partial decomposition of leaves and other plant material.
Hydrodynamic model	Mathematical formulation used in describing circulation, transport, and deposition processes in receiving water.
Hydrodynamics	The study of the movement of water within a waterbody, such as a river, lake, estuary, or coastal ocean environment.
Hydrograph	A graphic plot of changes in the flow of water or in the elevation of water level plotted against time.
Hydrologic cycle	The circuit of water movement from the atmosphere to the earth and return to the atmosphere through various stages or processes, such as precipitation, interception, runoff, infiltration, storage, evaporation, and transpiration.
Hydrology	The science dealing with the properties, distribution, and flow of water on or in the Earth.
Hydrolysis	Reactions that occur between chemicals and water molecules resulting in the cleaving of a molecular bond and the formation of new bonds with components of the water molecule.
Hypolimnion	The lower layer of a stratified water body, below the well-mixed zone.
Impervious	The characteristic of being incapable of penetration by water. Impervious areas refer to roads, parking lots, rooftops, and other land surface types that inhibit infiltration of precipitation and rapidly convey the resulting runoff to a waterbody.
In situ (in place)	In situ measurements consist of measurement of components or processes in a full-scale system or the field rather than in a laboratory.
Infiltration	The downward entry of water into the Earth's surface. Infiltration usually refers to water movement into a soil or rock surface, while the terms hydraulic conductivity, percolation, and permeability usually relate to water movement within a soil or rock layer.
Infiltration capacity	The maximum rate at which infiltration can occur under specific soil moisture conditions.
Influent	Any liquid that flows into a water body, treatment plant, or other facility; the opposite of effluent.
Initial conditions	A state of a system prior to an introduction of an induced stimulus. Describes conditions at the startup of system simulations.

Initial mixing zone	Region immediately downstream of an outfall where effluent dilution processes occur. Because of the combined effects of the effluent buoyancy, ambient stratification, and current, the prediction of initial dilution can be involved.
Inorganic	Pertaining to matter that is neither living nor immediately derived from living matter, such as sand, silt, and clay.
Interflow	The lateral subsurface movement of a significant amount of water through the soil above the regional water table as discharge to a waterbody.
Interstitial water	Water contained in the interstices, which are the pore spaces or voids in soils and rocks.
Invertebrate	Animals lacking a backbone.
Kinetic processes	Description of the dynamic rate and mode of change in the transformation or degradation of a substance in an ecosystem.
Labile	Substances that are quickly degraded, in contrast to refractory; also referring to fast adsorption.
Light saturation	Optimal light level for algal and macrophyte photosynthesis and growth.
Limiting factor	An environmental factor that limits the growth of an organism; the factor that is closest to the physiological limits of tolerance of that organism.
Limnetic zone	The open water zone of a lake or pond from the surface to the depth of effective light penetration.
Limnology	The scientific study of the biological, chemical, geographical, and physical features of fresh waters, usually lakes and ponds.
Lipids	Structural components of the cell that are fatty or waxy.
Littoral zone	The shoreward zone of a water body in which the light penetrates to the bottom, thus usually supporting rooted aquatic plants.
Load allocation (LA)	The portion of a receiving water's total maximum daily load that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources.
Loading, load, loading rate	The total amount of material (pollutants) entering the system from one or multiple sources; measured as a rate in weight per unit time.

Longitudinal dispersion	The spreading of chemical or biological constituents, including pollutants, downstream from a point source at varying velocities due to the differential instream flow characteristics.
Low-flow (7Q10)	Low-flow (7Q10) is the 7-day average low flow occurring once in 10 years; this probability-based statistic is used in determining stream design flow conditions and for evaluating the water quality impact of effluent discharge limits.
Macrofauna	Animals visible to the naked eye.
Macrophyte	Large, vascular aquatic plants, usually rooted.
Mass balance	An equation that accounts for the flux of mass going into a defined area and the flux of mass leaving the defined area. The flux in must equal the flux out.
Mathematical model	A system of mathematical expressions that describe the spatial and temporal distribution of flow and/or water quality constituents resulting from fluid transport and one or more individual processes and interactions within some prototype aquatic ecosystem.
Metabolism	Processes that make energy available in an organism.
Mineralization	The transformation of organic matter into an inorganic compound.
Mixing characteristics	Refers to the tendency for natural waters to blend; i.e. for dissolved and particulate substances to disperse into adjacent waters.
Monte Carlo simulation	A stochastic modeling technique that involves the random selection of sets of input data for use in repetitive model runs. Probability distributions of receiving water quality concentrations are generated as the output of a Monte Carlo simulation.
N/P ratio	The ratio of nitrogen to phosphorus in an aquatic system. The ratio is used as an indicator of the nutrient limiting conditions for algal growth.
Natural waters	Waterbodies (e.g., ponds, rivers, streams) within a physical system that have developed without human intervention, in which natural processes continue to take place.
Nitrate (NO ₃) and nitrite (NO ₂)	Oxidized nitrogen species; important nutrients for aquatic plants.
Nitrification	The oxidation of ammonium salts to nitrites (via <i>Nitrosomonas</i> bacteria) and the further oxidation of nitrite to nitrate (via <i>Nitrobacter</i> bacteria).

Nitrifier organisms	Bacterial organisms that mediate the biochemical oxidative processes of nitrification.
Nitrobacter	Type of bacteria responsible for the conversion of nitrite to nitrate.
Nitrogenous BOD (NBOD)	Refers to the oxygen demand associated with the oxidation of nitrate.
Nitrosomonas	Type of bacteria responsible for the oxidation of ammonia to the intermediate product nitrite.
Nonconservative substance	Substances that undergo chemical or biological transformation in a given environment.
Nonpoint source	Pollution that is not released through pipes but rather originates from multiple sources over a relatively large area. Nonpoint sources can be divided into source activities related to either land or water use including failing septic tanks, improper animal-keeping practices, forest practices, and urban and rural runoff.
Numerical model	Models that approximate a solution of governing partial differential equations which describe a natural process. The approximation uses a numerical discretization of the space and time components of the system or process.
Nutrient limitation	Deficit of nutrient (e.g., nitrogen and phosphorus) required by microorganisms in order to metabolize organic substrates.
Nutrient	A primary element necessary for the growth of living organisms. Carbon dioxide, nitrogen, and phosphorus, for example, are required nutrients for phytoplankton growth.
Offal	Waste parts of an animal, in contrast to fillets in a fish.
Omnivorous	Feeding on a variety of organisms and organic detritus.
One-dimensional model (1-D)	A mathematical model defined along one spatial coordinate of a natural water system. Typically 1-D models are used to describe the longitudinal variation of water quality constituents along the downstream direction of a stream or river. In writing the model, it is assumed that the cross-channel (lateral) and vertical variability is relatively homogenous and can, therefore, be averaged over those spatial coordinates.
Organic matter	Living organisms and material obtained from living organisms Commonly determined as the amount of organic material contained in a soil or water sample.
Organic nitrogen	Form of nitrogen bound to an organic compound.

Orthophosphate	Form of phosphate available for biological metabolism without further breakdown.
Outfall point	Point on a waterbody where water flows from a conduit, tributary stream, or storm drain.
Overland flow	The quantity of water that moves across the land surface. Contributions to overland flow are from runoff and from the surfacing of subsurface flows before they reach a receiving stream or a defined drainage channel.
Overturn	The complete circulation or mixing of the upper and lower waters of a lake when temperatures (and densities) are similar.
Oxidation	The chemical union of oxygen with metals or organic compounds accompanied by a removal of hydrogen or another atom. It is an important factor for soil formation and permits the release of energy from cellular fuels.
Oxygen demand	Measure of the dissolved oxygen used by a system (microorganisms) in the oxidation of organic matter. See also Biochemical Oxygen Demand.
Oxygen depletion	Deficit of dissolved oxygen in a water system due to oxidation of organic matter.
Oxygen saturation	Natural or artificial reaeration or oxygenation of a water system (water sample) to bring the level of dissolved oxygen to saturation. Oxygen saturation is greatly influenced by temperature and other water characteristics.
Parameter	A variable that must be given a specific value in a simulation. In mathematical models, parameters usually refer to characteristics of the system, such as reaction rates, decay constants, or partition coefficients.
Parameterize	To provide parameter values for a simulation.
Partition coefficients	Chemicals in solution are partitioned into dissolved and particulate adsorbed phases based on their corresponding partition coefficients, assuming equilibrium.
Peak runoff	The highest value of the stage or discharge attained by a flood or storm event, also referred to as flood peak or peak discharge.
Pelagic zone	Open water with no association with the bottom.
Pelagic	Living in the water column.

Percolation	The movement of water through soil or rock, usually from shallow soil or aquifer surfaces to deeper zones.
Periphyton	Algae attached to the bottom or to macrophytes.
Permeability	The capacity of soil, sediment, or porous rock to transmit water, usually in the vertical direction.
Pharmacokinetics	Transport and fate of chemicals within the body.
Photic zone	The region of aquatic environments in which the intensity of light is sufficient for photosynthesis.
Photoperiod	The seasonally varying period of daylight.
Photosynthesis	The biochemical synthesis of carbohydrate-based organic compounds from water and carbon dioxide using light energy in the presence of chlorophyll. Photosynthesis occurs in all plants, including aquatic organisms such as algae and macrophytes. Photosynthesis also occurs in primitive bacteria such as blue-green algae.
Phyla	The largest grouping of related organisms; examples include arthropods and molluscs.
Phytoplankton	A group of generally unicellular microscopic plants characterized by passive drifting within the water column. See Algae.
Piscivore	Fish eater; examples include game fish and hawks.
Plankton	Group of generally microscopic plants and animals passively floating, drifting, or swimming weakly. Plankton include the phytoplankton (plants) and zooplankton (animals).
Point source	Pollutant loads discharged at a specific location from pipes, outfalls, and conveyance channels from either municipal wastewater treatment plants or industrial waste treatment facilities. Point sources can also include pollutant loads contributed by tributaries to the main receiving water stream or river.
Pollutant	A contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of a natural environment. The term includes pathogens, toxic metals, carcinogens, oxygen demanding substances, or other harmful substances.
Pond	A body of standing water smaller than a lake, often artificially formed.
Population	A group of organisms of the same species.

Porewater exchange	Exchange of water contained within the sediment with the overlying river water. This exchange occurs through diffusion, bioturbation, and movement of groundwater through the sediment.
Postaudit	A subsequent examination and verification of model predictive performance following implementation of an environmental control program.
Predator	An organism, usually an animal, that kills and consumes another organism.
Pretreatment	The treatment of wastewater to remove or reduce contaminants prior to discharge into another treatment system or a receiving water.
Prey	An organism killed and at least partially consumed by a predator.
Primary productivity	A measure of the rate at which new organic matter is formed and accumulated through photosynthesis and chemosynthesis activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plant (carbon method).
Priority pollutant	Substances listed by the EPA under the Federal Clean Water Act as harmful substances and having priority for regulatory controls. The list includes metals (13), inorganic compounds (2), and a broad range of naturally occurring or artificial organic compounds (111).
Producer	An organism that can synthesize organic matter using inorganic materials and an external energy source (light or chemical).
Production	The amount of organic material produced by biological activity.
Productivity	The rate of production of organic matter. It may be primary, by plants, or secondary, by consumers.
Publicly Owned Treatment Work (POTW)	Municipal wastewater treatment plant owned and operated by a public governmental entity such as a town or city.
Raw sewage	Untreated municipal sewage.
Reaction rate coefficient	A factor in formulas describing the rate of transformation of a substance in an environmental medium characterized by a set of physical, chemical, and biological conditions such as temperature and dissolved oxygen level.
Reaeration	The net flux of oxygen occurring from the atmosphere to a body of water.

Receiving waters	Creeks, streams, rivers, lakes, estuaries, groundwater formations, or other bodies of water into which surface water and/or treated or untreated waste are discharged, either naturally or in man-made systems.
Recharge	Downward movement of water through soil to groundwater derived from precipitation on the overlying land surface.
Recurrence interval	Average amount of time between events of a given magnitude. For example, for a recurrence interval of 100 years, there is a 1% chance that a 100-year flood will occur in any given year.
Refractory organics	A broad category of detritus and chemicals that resist chemical or bacterial decomposition.
Refractory	Slowly degraded, in contrast to labile.
Relief	Variations or differences in elevation or height of land forms on the Earth's surface.
Remote sensing	A method for determining the characteristics of a landscape or community from afar.
Reserve capacity	Pollutant loading rate set aside in determining stream waste load allocation accounting for uncertainty and future growth.
Residence time	Length of time that a pollutant remains within a section of a stream or river. The residence time is determined by the streamflow and the volume of the river reach or the average stream velocity and the length of the river reach.
Respiration	Breathing; the oxidative breakdown of cellular material to release energy. During respiration, oxygen is consumed and carbon dioxide is released.
Riparian	Pertaining to the banks of a river, stream, or other body of water as well as to plant and animal communities along such bodies of water.
Risk assessment	The qualitative and quantitative evaluation performed in an effort to define the risk posed to human health and/or the environment by the presence or potential presence and/or use of specified pollutants.
Riverine	Pertaining to areas on or near the banks of rivers.
Rough fish	A non-sport fish, usually omnivorous in food habits.
Roughness coefficient	A factor in velocity and discharge formulas representing the effects of channel roughness on energy losses in flowing water. Manning's "n" is a commonly used roughness coefficient.

Routing	Derivation of an outflow hydrograph of a stream from known values of upstream flow, using the wave velocity and/or storage equation; technique used to compute the effect of channel storage and translation on the shape and movement of a flood wave through a river reach.
Runoff	Precipitation, snow melt, or irrigation water that appears in uncontrolled surface streams or rivers.
Scour	The abrading action of flowing water; the erosion of a channel or streambed and abrasion of periphyton and macrophytes, especially during flood events.
Secchi depth	A measure of the light penetration into the water column, influenced by turbidity due to suspended sediments, phytoplankton, and dissolved organic matter.
Sediment load	Total sediment, including bedload, being moved by flowing water in a stream at a specified cross section.
Sediment Oxygen Demand (SOD)	The solids discharged to a receiving water are partly organics, and upon settling to the bottom, they decompose anaerobically as well as aerobically, depending on conditions. The oxygen consumed in aerobic decomposition represents another dissolved oxygen sink for the waterbody.
Sedimentation	Deposition of waterborne sediment; also refers to the infilling of bottom substrate in a waterbody by sediment (siltation).
Sediment	Particulate organic and inorganic matter that is transported and accumulates in waterbodies.
Seepage	The relatively slow trickling of water or other liquid from a source.
Shoal	A shallow place in a body of water.
Siltation	The deposition of silt-sized and clay-sized (smaller than sand-sized) particles.
Simulation	Refers to the use of mathematical models to approximate the observed behavior of a natural system in response to a specific known set of input and forcing conditions. Models that have been validated, or verified, are then used to predict the response of a natural system to changes in the input or forcing conditions.
Soil erosion	The processes by which soil is removed from one place by forces such as wind, water, waves, glaciers, and construction activity and eventually deposited at some new place.

Sorption	The adherence of ions or molecules in a gas or liquid to the surface of a solid particle with which they are in contact. The removal of an ion or molecule from solution by adsorption and absorption. The term is often used when the exact nature of the mechanism is not known.
Spatial segmentation	A numerical discretization of the spatial component of a system into one or more dimensions; forms the basis for application of numerical simulation models.
Stabilization pond	Large earthen basins that are used for the treatment of wastewater by natural processes involving the use of both algae and bacteria.
Stage	Height of a water surface above some established reference point at a given location.
State variable	A compartment that is being represented with a numerical model.
Steady-state model	Mathematical model of fate and transport that uses constant values of input variables to predict constant values of receiving water quality concentrations.
Stoichiometric ratio	Mass-balance-based ratio for nutrients and organic carbon (e.g., nitrogen-to-carbon ratio) in organisms and detritus.
STORET	U.S. Environmental Protection Agency (EPA) national water quality database for STORage and RETrieval (STORET). Mainframe water quality database that includes physical, chemical, and biological data measured in waterbodies throughout the United States.
Storm runoff	Rainfall that does not evaporate or infiltrate the ground because of impervious land surfaces or a soil infiltration rate lower than rainfall intensity, but instead flows onto adjacent land or waterbodies or is routed into a drain or sewer system.
Stratification (of water body)	Formation of water layers, each with specific physical, chemical, and biological characteristics. As the density of water decreases due to surface heating, a stable situation develops with lighter water overlaying heavier and denser water.
Streamflow	Discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term streamflow is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.
Substrate	The layer on which organisms grow, often synonymous with surface; also, a substance attached by an enzyme.

Succession	The replacement of one biotic assemblage with another through time.
Surface waters	Water that flows in streams, rivers, natural lakes, and wetlands; in reservoirs or impoundments constructed by humans; and in estuaries.
Suspended solids or Load	Organic and inorganic particles (sediment) suspended in and carried by a fluid (water). The suspension is governed by the upward components of turbulence, currents, or colloidal suspension.
Temperature coefficient	Rate of increase in an activity or process over a 10 degree Celsius increase in temperature.
Thalweg	The lowest point, or elevation, in the channel bed taken within a cross-section perpendicular to the direction of flow.
Three-dimensional model (3-D)	Mathematical model defined along three spatial coordinates where the water quality constituents are considered to vary over the three spatial coordinates of length, width, and depth.
Tolerance	An organism's capacity to endure or adapt to unfavorable conditions.
Topography	Representation of natural and artificial physical features of the landscape.
Total coliform bacteria	A particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35 degrees Celsius. See also Fecal coliform bacteria.
Total Kjeldahl Nitrogen (TKN)	The total of organic and ammonia nitrogen in a sample, determined by the Kjeldahl method.
Toxic substances	Those chemical substances, such as pesticides, plastics, heavy metals, detergent, solvent, or any other material that are poisonous, carcinogenic, or otherwise directly harmful to human health and the environment.
Transect sampling	Sequential river water sampling at several stations providing instantaneous "snapshots" of water column parameters.
Transport	Conveyance of solutes and particulates in flow systems.
Transport of pollutants (in water)	Transport of pollutants in water involves two main process: (1) advection, resulting from the flow of water, and (2) diffusion, or transport due to turbulence in the water.
Travel time	Time period required by a particle to cross a transport route such as a watershed, river system, or stream reach.

Tributary	A stream that contributes its water to another stream or body of water. A lower order stream compared to a receiving waterbody. "Tributary to" indicates the largest stream into which the reported stream or tributary flows.
Trickling filter	A wastewater treatment process consisting of a bed of highly permeable medium to which microorganisms are attached and through which wastewater is percolated or trickled.
Trophic level	All organisms that secure their food at a common step in the food chain.
Turbidity	Measure of the amount of suspended material in water.
Turbulence	A type of flow in which any particle may move in any direction with respect to any other particle and in a regular or fixed path. Turbulent water is agitated by cross currents and eddies. Turbulent velocity is that velocity above which turbulent flow will always exist and below which the flow may be either turbulent or laminar.
Turbulent flow	A flow characterized by irregular, random-velocity fluctuations.
Two-dimensional model (2-D)	Mathematical model defined along two spatial coordinates where the water quality constituents are considered averaged over the third remaining spatial coordinate. Examples of 2-D models include descriptions of the variability of water quality properties along: (a) the length and width of a river that incorporates vertical averaging or (b) length and depth of a river that incorporates lateral averaging across the width of the waterbody.
Ultimate Biochemical Oxygen Demand (UBOD or BOD _U)	Long-term oxygen demand required to completely stabilize organic carbon in wastewater or natural waters.
Unsaturated zone	The subsurface zone between the water table (zone of saturation) and the land surface where some of the spaces between the soil particles are filled with air. Also called vadose zone.
Unstratified	Indicates a vertically uniform or well-mixed condition in a waterbody. See also Stratification.
Verification (of a model)	Subsequent testing of a precalibrated model to additional field data usually under different external conditions to further examine model validity (also called validation).
Volatilization	Process by which chemical compounds are vaporized (evaporated) at given temperature and pressure conditions by gas transfer reactions. Volatile compounds have a tendency to partition into the gas phase.

Wastewater treatment	Chemical, biological, and mechanical procedures applied to an industrial or municipal discharge or to any other sources of contaminated water in order to remove, reduce, or neutralize contaminants.
Wastewater	Usually refers to effluent from a sewage treatment plant. See also Domestic wastewater.
Water quality standard (WQS)	A law or regulation that consists of the beneficial designated use or uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the use or uses of that particular waterbody, and an antidegradation statement.
Water quality	The biological, chemical, and physical conditions of a water body. It is a measure of a water body to support beneficial uses.
Water table	The upper limit of that part of the ground that is saturated with groundwater.
Watershed	All lands enclosed by a continuous hydrologic drainage divide and lying upslope from a specified point on a stream; also, an entire drainage basin.
Wetland	Area that is regularly wet or flooded and has a water table that stands at or above the land surface for at least part of the year, such as a bog, pond, fen, estuary, or marsh.
Wind mixing	Refers to a physical process occurring when wind over a free water surface influences the atmospheric reaeration rate.
Zero-order kinetics	Describes the rate of transformation or degradation of a substance; the reaction rate of change is independent of the concentrations in solution.
Zooplankton	Very small animals (protozoans, crustaceans, fish embryos, insect larvae) that live in a waterbody and are moved passively by water currents and wave action.